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ABSTRACT

This is the second of a series of three bulletins dealing with "Supervisory Strategies in Clinical Experiences." The first of the two papers, "Microteaching: History and Present Status," by James M. Cooper and Dwight W. Allen, begins with a definition of microteaching as a teaching situation which is scaled down in terms of time and numbers of students, but which is not synonymous with simulated teaching, as the teacher, students, and lesson are all "real." The history of microteaching from its development in 1963 is outlined, followed by an explanation of the rationale, the uses of microteaching in preservice and inservice training in the Peace Corps, counseling, supervisor training, and the training of college teachers. Research evidence on the effectiveness of microteaching is examined and the teaching skills involved are listed. There is a bibliography of 58 items. The second paper, "Microteaching in Teacher Education Programs," by Robert F. Schuck, considers three programs: 1) the original Stanford Teacher Education Project, which developed nine specific technical skills in secondary education; 2) the Brigham Young University Program, which forms part of the preservice curriculum; and 3) the San Jose State College Study of that institution's program for elementary intern teachers. A brief concluding section suggests that microteaching holds promise as a research strategy for investigators interested in patterns of instruction. (MBM)

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MICROTEACHING: HISTORY AND PRESENT STATUS

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MICROTEACHING IN TEACHER EDUCATION PROGRAMS

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University of Pittsburgh

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ATE Research Bulletin 9

is the second in a series on
"Supervisory Strategies in Clinical Experiences"

* * *

Other Bulletins in the Series

Simulation as an Instructional Alternative in Teacher Preparation
ATE Research Bulletin 8

Interaction Analysis: Selected Papers
ATE Research Bulletin 10

PREFACE

Until recently teacher education programs relied upon the traditional sequence of observation, participation, and student teaching to provide the necessary practice in learning to teach. The focus was often blurred, the analyses opinionated, and the feedback distorted or vague. They were all we had, however, and supervisors in schools and colleges labored mightily with inadequate tools.

The development of conceptual tools for the analysis of teaching has now opened up the possibility of selective analysis of specific aspects of a teaching situation. Video and audio recorders have made it possible to play back samples of classroom interaction as a basis for analytical conferences. Role-playing techniques have been refined and extended to become complex, simulated situations supported by carefully coordinated media systems.

The resources are now available for the development of a competency-based and systematically designed teacher education program. They also make possible a great variety of improvements in any type of program. As contributions to the literature reporting on these resources, the Association of Teacher Educators and the ERIC Clearinghouse on Teacher Education (see page 52) decided to publish jointly three monographs (issued as ATE Research Bulletins) comprising a series on "Supervisory Strategies in Clinical Experiences."

Microteaching: Selected Papers (Research Bulletin 9) is the second in the series. James M. Cooper and Dwight W. Allen, authors of "Microteaching: History and Present Status," are individuals whose work in this field is well known. Their paper was commissioned by the ERIC Clearinghouse on Teacher Education. Robert F. Schuck's "Microteaching in Teacher Education Programs" is a review of some significant research studies which have been made.

Scheduled next is *Interaction Analysis: Selected Papers* (Research Bulletin 10), which includes contributions by Norma Furst, Temple University; J. T. Sandefur and Alex A. Bressler, Kansas State Teachers College; and Donald P. Johnston, United States International University. The first bulletin in this series was *Simulation as an Instructional Alternative in Teacher Education* (Research Bulletin 8), by Donald R. Cruickshank of Wheelock College.

The ideas presented in this bulletin and its companions in the series are not necessarily those of the Association of Teacher Educators or the ERIC Clearinghouse on Teacher Education and its sponsors.*

The ATE and the Clearinghouse are grateful to all those whose efforts have made this series possible. They hope the ideas expressed may be of special value to those who have some responsibility in developing programs of clinical experiences which exemplify the ATE *Guide to Professional Excellence.* If so, their purpose will be well served.

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JAMES M. COOPER
DWIGHT W. ALLEN

Microteaching: History and Present Status

Since its inception in 1963, microteaching has become an established teacher-training procedure in many colleges, universities, and school districts. James A. Johnson of Northern Illinois University, in a national survey of student teaching programs, cites figures which indicate that 44 percent of all teacher education programs use some form of microteaching (33:56). Despite its apparent widespread usage, microteaching is still considered an innovation in teacher education as evidenced by the introductory presentations on microteaching that appeared at the 1969 national conventions of the American Educational Research Association, the American Association of Colleges for Teacher Education, the Association for Supervision and Curriculum Development, and the National Catholic Education Association. Like other educational innovations, microteaching has frequently been implemented without regard to the existence of research evidence which validates its use.

The purpose of this paper is therefore to present the history of microteaching's development and its rationale, to summarize the many uses of microteaching, and to summarize the research evidence on microteaching.

MICROTEACHING DEFINED

Defined most succinctly, microteaching is a teaching situation which is scaled down in terms of time and numbers of students. Usually, this has meant a 4-20 minute lesson involving from three to ten students. The lesson is scaled down to reduce some of the complexities of the teaching act, thus allowing the teacher to focus on selected aspects of teaching. Frequently, one microteaching episode includes teaching a lesson and immediate feedback on the teacher's effectiveness. This feedback may come from videotape or audiotape recordings, supervisors, pupils, colleagues, or from the teacher's self-perceptions. Some of the variable aspects of microteaching include lesson length, number of reteaches, the amount and kind of supervision, the use of videotape or audiotape recordings, and number and types of pupils.

Microteaching is not synonymous with simulated teaching. Rather, the teacher is a real teacher, the students are real students, and learning does occur in the short lessons. Many reports of microteaching programs describe the students as peers, that is, fellow student teachers. The authors of this paper do not consider this to be microteaching. In many cases, the peers are usually role playing: they are acting as they think secondary or elementary school students would behave. Even if they are not role playing, but behaving naturally, they are still not part of the population the student teachers are preparing to teach. While peer teaching can be a very valuable experience, the authors believe it should not be equated with microteaching, where the students are "real."

HISTORY

Although a simple idea, microteaching was late arriving on the educational scene. It developed at Stanford University in 1963 from an attempt to find a new, more effective initial training of preintern teachers. The original efforts had produced the demonstration lesson, where the interns were asked to teach a game to a group of four students. These students were role playing stereotyped students: slowpoke, couldn't-care-less, eager, and know-it-all. The situation was rigged to provide the interns with a lesson in humility designed to impress upon them the need to learn instructional techniques.

From this extremely artificial situation developed the concept of microteaching. Instead of having the students role play, they were asked to prepare a short lesson of their own choosing in their subject matter area. Although this procedure was deemed by the Stanford Secondary Education Project staff as an improvement over the demonstration lesson, it still seemed to lack direction. What was missing was the teaching techniques dimension. In the summer of 1963, Horace Aubertine developed the technical teaching skill "How To Begin a Lesson," as part of a research study. The interns were instructed to use this skill in their microteaching lessons. As a result of this experience, the practice of focusing on one skill at a time evolved and proved to be quite successful. It was decided that for future microteaching clinics, additional teaching skills would be developed.

These teaching skills refer to specific teacher behaviors designed to influence learners in a predetermined direction (35). This required that both teacher and learner behaviors be operationally defined and that the desired interactions be derived from a theoretical rationale.

The teaching skills approach is based on the assumption that by breaking down the complex teaching act into more easily learned skills, the teacher can gradually acquire a repertoire of teaching skills

to use in the actual classroom. By building a repertoire of skills, the teacher is increasing his flexibility and versatility. He has more teaching techniques at his command in order to vary his questions, reinforcement, or presentation styles. Thus, he is able to adapt his teaching style to suit the students' needs or the objectives of the lesson. There is research evidence which indicates that the flexible teacher, the one who can adapt his teaching methods, is more effective in producing positive student performance and attitude than a teacher who lacks this versatility (31:343).

The most widespread use of microteaching, therefore, has focused on the teacher's development of a repertoire of teaching skills. Since 1963, over twenty different general teaching skills applicable to elementary and secondary teachers across most subject matter areas have been developed. Most of these skills were identified through an informal task analysis of teachers in their classrooms. Once the skill was identified, its behavioral components were isolated and training protocols were developed using a microteaching format. A partial list and description of these skills can be found in the Appendix (p. 20).

RATIONALE

The rationale for microteaching as a teacher-training technique has been set forth by several authors:

1. The fact that microteaching is *real teaching*, albeit constructed in the sense that teacher and students work together in a practice situation, is a point made by several authors (6;2).
2. Microteaching *reduces the complexities* of normal classroom teaching, thus allowing the teacher to concentrate on the acquisition of a teaching skill (22;6;18).
3. *Knowledge and information about performance aids* the learner (in this case the teacher) in his acquisition of a teaching skill. The immediate feedback from videotape recorders, supervisors, pupils, and colleagues provide a critique of the lesson which will help the teacher constructively modify his behavior (45).
4. Microteaching considers the *trainee's capacities* by allowing him to select the content of the lesson from the area of his greatest competence (45).
5. Microteaching provides a setting in which the trainee can teach *students of varying backgrounds, intellectual abilities, and age groups* before facing a class during his student or intern teaching (2).
6. Microteaching permits *greater control* over the trainee's environment with regard to students, methods of feedback, supervision, and many other manipulatable variables (6).

7. Microteaching provides a *low-threat situation* in which to practice teaching skills, a situation which should be more conducive to learning than the high anxiety level exhibited by many beginning teachers when practicing in actual classrooms (2).
8. Microteaching is a *low-risk situation* for both teacher and pupils. Microteaching is not part of the pupils' regular curriculum; therefore, their learning is not endangered. Similarly, the teacher need not fear failure for precisely the same reason (2).
9. Since *active participation* by the trainee is preferred and meaningful materials and tasks are desirable for optimal learning to occur, the microteaching setting allows the student to perfect certain skills that he will subsequently be expected to perform in the regular classroom (45).
10. Microteaching allows for the repetitive practice necessary to *overlearn* skills which will be used during regular teaching (45).
11. Microteaching incorporates *spaced or distributed practice* of a skill over a period of time, allowing for the neurophysiological consolidation of the new data for long-term storage and retrieval (45).

None of the cited authors look upon microteaching as a panacea for the ills of teacher education. For example, the problems of classroom control and discipline have yet to be successfully solved within a microteaching format. But the authors are virtually unanimous in their praise of microteaching as a technique for training teachers to use some basic teaching skills (45;6;36;18;25).

USES OF MICROTEACHING

Preservice Training

The primary use of microteaching to date has been for preservice training of student or intern teachers. This was the original purpose of microteaching as it developed at Stanford University. Using the microteaching format, the preservice training has focused primarily on the acquisition of teaching skills.

The usual format at the preservice level has been for the trainees to first receive instruction in the particular skill to be practiced. This instruction may be written, oral, videotaped, or filmed. A number of institutions use a combination of these methods (55). After the skill is explained, the trainees often will see a videotaped or filmed model of a teacher demonstrating that skill. This model will be discussed until the trainees are clear as to the skill they will be practicing in microteaching. Ward (55) found that the skills most often used were

Asking Questions, Using Reinforcement Techniques, Establishing Set, Using Examples, and Varying the Stimulus.

A trainee then teaches a short lesson, usually 5-10 minutes, in his own subject field and of his own choosing to a small number of students, while trying to master the skill. Whenever possible, the lesson is videotaped or audiotaped to allow the trainee to observe or hear himself. There is usually a supervisor present who helps the trainee analyze the strengths and weaknesses of the lesson and discusses how the lesson might be improved. Frequently colleagues or other trainees will observe one another teaching and offer their comments on the lesson. A number of programs also utilize student feedback to help the teacher in a critique of the lesson.

One hundred twenty-five institutions use the videotape recorder in microteaching for secondary school teachers (55). Although videotape equipment is not necessary for microteaching, it does add tremendous power to the feedback dimension.

After the critique, the trainee usually has a break period in which he replans the lesson in order to incorporate the suggestions from the critique. Although there is no solid research evidence regarding the optimal length of time for planning, there is some evidence that 15 minutes or less is not long enough (47).

Once the teacher has replanned the lesson, he teaches it again to a different group of students in order to get initial responses from the students. Ninety-nine institutions out of 136 replying to Ward's survey questionnaire indicated that they either always or sometimes used the teach-reteach cycle. After the reteach lesson, the same sources of feedback are used again in the critique. This cycle can be repeated as often as desired while the trainee continues to develop a particular skill. Usually, however, after one teach-critique/reteach-critique cycle, the trainee will plan new content while continuing to practice the same skill.

One interesting point should be noted. Despite the authors' prejudice against using peers as students, 111 institutions indicated that they did use peers instead of actual pupils (55). Probably the main reason for using peers is the difficulty encountered in obtaining actual pupils. These pupils are in school all day and therefore usually are available for microteaching only in the evening. This is especially true if the microteaching is conducted at a college or university rather than at the public schools, and the university is by far the most common locale for microteaching (55). If the program operates during the summer, actual students can be paid for their services, but many institutions find the cost restrictive. As a consequence, the utilization of peers as students, at least at the secondary level, far

outnumbers the use of actual students for the microteaching process at the preservice level.

In addition to the format just described, another format that has been used is a 20-25 minute lesson, followed by a 30-40 minute critique. This training protocol was used at Stanford, following three weeks of the teach-critique/reteach-critique format. There were several reasons for changing the pattern. By lengthening the time of the lesson, the trainee was able to start planning and teaching lessons which were closer in length to the lessons he would teach in the regular classroom. This longer format ran for three weeks, during which time the trainees were divided into teams of three or four. These teams then planned a three-week unit to teach to a single group of students. The team members selected the objectives, organized the learning experiences, and decided how they would evaluate the lesson. This process gave them experience in team planning, team teaching, and the construction of a teaching unit and an opportunity to work with a single group of students over an extended period of time. Although each of the trainees was working on a particular skill during this three-week period, the major concern during the critique sessions was less with the skill than the appropriateness of objectives and techniques, organization, and student involvement. No formal evaluation was ever made to compare the effectiveness of the two microteaching formats described, but the general feeling of the trainees and the supervisors at Stanford was that the shorter lesson was more effective for some skills, such as silence and nonverbal communication, while the longer lesson was more effective for skills such as set induction and closure.

In-Service Training

Although the greatest use of microteaching has been at the preservice level, increasing interest in this technique is being generated at the in-service level. Several uses of microteaching for in-service teachers have been suggested (1). These include microteaching—

1. As a trial framework for team presentation.
2. As a site for ascertaining the proper instructional level of materials.
3. As a method of preemployment prediction.
4. As a means of training supervisors to evaluate beginning teachers.

One example of the in-service use of microteaching is provided by the Jefferson County, Colorado, extended summer program (45).

This program was designed to upgrade the entire instructional program in the school district by providing in-service training opportunities in team teaching and flexible scheduling. Each teaching team used microteaching to perfect curriculum before trying it before a whole class, and the videotape of the microlesson was viewed by the team to evaluate its teaching. By the summer's end more than one hundred competent teachers had experienced microteaching, along with several hundred children who had participated in an enriching experience. Meier reports that the school system has benefited enormously from this massive in-service training program and has since introduced many of its validated innovations into the regular school-year program.

Meier (44;45) also reports on another in-service program conducted under the auspices of the National Defense Education Act, Title XI, by the Child Study Institute at Colorado State College. One hundred teachers in early childhood education programs throughout the country received training in how to manage new programs for preschool and beginning school children. This in-service program was conducted by means of filmed learning episodes, videotaped recordings of the teachers' efforts to recreate the learning episodes in their own locations, and supervision provided by personnel located at the Child Study Institute in Greeley. This long-distance microteaching was conducted in the following manner. After watching the filmed learning episodes and reading the accompanying written materials, each teacher tried to achieve the objectives of the episode through a microteaching process. After practicing several times, the teacher mailed a representative videotape of his efforts to the Child Study Institute where a team critique was made, an evaluation given, and the recording and evaluation mailed back to the teacher. When the teacher was satisfied that he had achieved the objectives of the episode, a new unit was sent to him. Upon completion of the course, the participating teachers received college credit from Colorado State College. The effectiveness of the training program was assessed by determining the teachers' attitudes and opinions about the method of training and by observing changes in the teachers' cognitive and affective behavior through analysis of the microteaching critique instruments. The trainees showed growth on both the cognitive and attitude tests which were administered at the beginning and end of the program.

Probably the most comprehensive development of microteaching for in-service training is that being conducted by the Far West Laboratory for Educational Research and Development. Its mini-course model utilizes instructional films, handbooks, evaluation

forms, a microteaching format, and videotaped recordings of teachers' lessons. The minicourse is discussed in more detail on page 15.

Another in-service project combined microteaching and interaction analysis for teachers in El Dorado County, California (49). Twenty-eight experienced teachers were enrolled in a university extension course which had cognitive process in science as a focus. After receiving training in interaction analysis and new teaching strategies in science, each strategy was translated into a teaching pattern which was practiced in a microteaching setting. Significant differences ($p < .01$) in pretest and posttest percentile scores on the MTAI for the participating teachers and feedback from building principals confirmed that the participating teachers continued to try new teaching behaviors in the classroom and retained a positive attitude toward the microteaching-interaction analysis combination.

The General Learning Corporation has attempted to overcome one of the major drawbacks preventing successful in-service microteaching. This has been the lack of written materials describing skills and accompanying filmed models of teachers demonstrating those skills. Without a high level of expertise available, most school districts were unable to generate a successful microteaching program. The publication of *Teaching Skills for Elementary and Secondary School Teachers* (8) has made detailed skills descriptions and accompanying filmed models available to school districts and colleges for both in-service and preservice training.

Although microteaching's usage has been greater at the preservice level, its popularity as an in-service training procedure seems to be increasing. Ward (55) reports that there are fifty-three colleges and universities that have contributed directly to the use of microteaching techniques for in-service education in their respective states. In addition to this number, there are probably school districts using microteaching without consultation with a college. As more and more school districts concern themselves with increasing the teaching skills of their experienced teachers, microteaching will continue to grow in popularity as an in-service training procedure.

Peace Corps Training

A large number of Peace Corps volunteers are trained to be teachers. Since the normal tour of duty is only two years, a condensed teacher-training program is essential in order to utilize the volunteers' time effectively. It was only natural that the efficiency of microteaching as a teacher-training procedure be explored. Microteaching became a major component in the volunteers' training in at

least two Peace Corps centers.

The first center was located at Stanford University and was the site for training forty-nine volunteers for assignments in the Philippines. The microteaching clinic had three objectives: to teach the volunteers skills related to the teaching of English as a second language, to acquaint them with special materials for teaching English as a second language, and to provide a reality test during which the volunteers could decide if they really wanted to become elementary school teachers in the Philippines for the next two years (4). Using Filipino students who had been in the United States for less than six months, the microteaching experience provided contact with students who spoke little or no English, thus representing a good test of the trainees' ability to communicate with native children. Beginning with a 5-minute, four-pupil format, the trainees moved to larger classes, longer lessons, more demanding subject matter, and finally complex interpersonal situations in which to make teaching decisions.

A second case of using microteaching for Peace Corps training involved a group of 330 volunteers going to Micronesia (6). Using an abandoned bathhouse which was being renovated during the microteaching and Cuban refugee children who spoke little English, the clinic concentrated on preparing TESL (Teaching English as a Second Language) teachers. The clinic format was basically a 5-10 minute lesson, with a 10-minute critique involving two trainees and the supervisor. There were no videotape recorders. Different techniques for getting across the same sentence structure, aspects of the lesson that might have been confusing to the students, and similar techniques and problems were discussed. Since the children were not changed, the reteach lessons were extensions of the first lessons. A survey indicated that 97 percent of the trainees felt microteaching was valuable or extremely valuable in their preparation for teaching. Over 95 percent recommended microteaching experience for future trainees.

Microcounseling

A fruitful adaptation of microteaching has occurred recently in counselor education. While at Colorado State College, Allen Ivey and his colleagues developed microcounseling, a process whereby trainees systematically practice basic component skills of counseling (32). Thus far, three controlled research studies involving microcounseling have been conducted. The three skills that have been identified are attending behavior, Rogerian reflection of feeling, and summarization of feeling.

The first, attending behavior, is considered by Ivey to be one of the basic counseling skills. He defines the skill as attending or listening to a client both verbally and nonverbally. The skill is behaviorally defined as establishing eye contact with the client; communicating attentiveness through gestures, movements, and posture positions; and demonstrating verbal attention by responding to the client's last comment without introducing new data.

The second, reflection of feeling, is also considered a key counseling skill. Communication of warmth and genuineness are the essential dimensions of this skill. Microcounseling treats reflection of feeling as a type of attending behavior in which the counselor selectively attends to one certain aspect of his interaction with the client.

The third, summarization of feeling, is an extension of the first two skills in that the counselor is attending to a broader class of stimuli and must bring seemingly diverse elements into a meaningful whole. This is achieved when the counselor can summarize the client's comments and relate them to a central theme or emotion.

In each of the three studies, the counselor trainees using microteaching significantly improved their ability to perform the skills. Ivey summarizes the implications and future of his work as follows:

> Most counselor-educators have spent long hours training beginners in the skills of counseling, and most would agree that training neophyte counselors in these skills is a difficult and taxing task. Microcounseling training seems to provide a framework to make professional counselor training and the training of lay counselors more meaningful and effective. Further, this type of training may be equally important to the teacher, the administrator and the student. The microteaching and microcounseling framework may be the means by which the developmental skills of living may be taught (6).

Supervisor Training

While the microteaching format developed as a teacher-training technique, it also has great utility for the training of supervisors. Aubertine (10:99-100) reports the following areas of investigation conducted at the microteaching clinic at Whitman College, Walla Walla, Washington:

1. Would the continuity in the teacher-training process be improved if the supervising teachers were trained in supervision procedures, applied them in microteaching sessions, and then evaluated the outcomes?
2. Which areas in the training of clinical supervisors would be most appropriate for the use of microteaching?

3. What effects would the training of clinical supervisors have in increasing interest in the use of microteaching as part of an in-service training program for teachers?

As a result of the supervisors' training during the clinic, Aubertine (10:104) concluded that microteaching was worthwhile in the development of—

a. adroitness in utilizing conceptual models and in analyzing the teaching process with new insights into the instructional act.

b. sophistication in interpreting high school pupil behavior.

c. dexterity in selecting and synthesizing relevant aspects of a lesson.

d. expertise in devising and asking probing questions of the student-teacher in order to aid him [to] analyze his instruction and create alternatives in it.

e. facility in human relations, especially in creating rapport with the student-teachers by way of increased sensitivity to his problems.

f. capacity to instill and build confidence within the student-teacher.

Although interest in some form of in-service microteaching was generated, for a variety of reasons plans were still in an exploratory stage. Aubertine goes on to recommend strongly the use of videotape recorders as a means of increasing supervisory effectiveness in observation and assessment of instruction.

Training College Teachers

Microteaching has also been used for improving college teaching. In the spring of 1967, a three-day workshop was conducted for college teachers at Vanderbilt University, under the auspices of the American Society for Engineering Education. Participants in the workshop came from Tennessee A&I State University, North Carolina A&I, Tuskegee Institute, Southern University, and Prairie View A&M College (6). The microteaching clinic was conducted by James M. Cooper and David B. Young, then doctoral students at Stanford University, as part of the three-day workshop. Each participant taught a 10-minute diagnostic lesson which he had previously prepared. The lesson was videotaped and a 20-minute critique followed, using student (college engineering students) and supervisory feedback. During the critique, the skill of Varying the Stimulus was introduced, both orally and in written form. The behavior to be practiced was clarified, and the college teachers had a half-hour break to prepare for the reteach. The reteach lesson followed and again was videotaped and analyzed in terms of the teacher's use of the skill.

A survey of the twenty participants revealed the microteaching experience to be a unanimous success. Although many were originally apprehensive about participating, all agreed it was a helpful experience and recommended microteaching experiences for other teachers.

Another report of microteaching for college teachers comes from Arye Perlberg at the University of Illinois (50;51). In general, Perlberg found the use of microteaching and videotape recorders very helpful in assisting college teachers to analyze their teaching.

EVIDENCE REGARDING EFFECTIVENESS OF MICROTEACHING

A large majority of the articles reviewed for this paper are based on experiential studies rather than experimental studies. However, some which present research evidence regarding behavioral change will be described.

One of the better research studies was performed by Camille G. Bell at Texas Technological College with home economics teacher trainees (11). Using a control group which engaged in student teaching without microteaching and an experimental group which participated in microteaching after their student teaching, Bell tested six null hypotheses:

1. There is no significant gain in the teaching performance of student-teachers in the experimental group who were trained in certain teaching techniques by microteaching *after* their student teaching experience in various schools. (Rejected at the .01 level of significance.)
2. There is no significant gain in teaching performance of student-teachers in the control group whose teaching was recorded on videotape *before and after* their student teaching experience in various schools. (Accepted.)
3. There is no significant difference in teaching performance of the student-teachers in the experimental group on their *first* microteaching lesson and the teaching performance of the student teachers in the control group on their *final* microteaching lesson. (Accepted.)
4. There is no significant relationship between certain demographic variables—age, socioeconomic status, father's education, GPA of student-teachers of both groups—and the improvement in microteaching performance as evaluated by judges. (Accepted.)
5. There is no significant reliability of the evaluations of the judges. (Coefficient reliability of all raters, .89.)

6. There is no significant difference in the training performance on the final lessons of the control and of the experimental groups. (Rejected at least at the .01 level of significance.)

The main conclusion drawn by Bell was that the addition of microteaching to the program of preparing student teachers is "a relatively more powerful treatment in contributing to gains in teaching effectiveness than the usual form of preparation provided by pre-service and student-teaching experience" (11).

In another study conducted at Stanford University in the summer of 1963, more than sixty teacher education candidates in the secondary education program were randomly divided into two equal groups, half given the standard observation and teacher aide experience and the other half concentrated training in the micro-teaching clinic (18). Findings of that experimentation were:

1. The microteaching group performed at a higher level of teacher competence than the traditionally prepared group.
2. Performance in the microteaching situation predicted subsequent classroom performance.
3. There was a significant increase in the accuracy of candidates' self-perception of teaching performance.
4. Candidates receiving student appraisal of their effectiveness improved significantly more than candidates not having access to such feedback.
5. Trainees' acceptance of the value of microteaching was high.
6. Three skills subjected to experimental treatment in microteaching produced significant changes in the trainees' performance.

Reporting on the Stanford Summer Microteaching Clinic in 1965, Fortune, Cooper, and Allen (26) stated that significant teacher behavior changes occurred over the six-week period. Nine of the first twelve items on the Stanford Teacher Competence Appraisal Guide showed significant ($p < .01$) mean gain. This mean gain is indicative of substantial intern improvement in the items showing change.

A questionnaire designed to evaluate trainee acceptance of microteaching indicated that less than 15 percent of the interns reported that the experience was of little or no value, while more than 60 percent of the interns returning the questionnaire felt it to be either very or extremely valuable.

With reference to the 1966 Stanford Microteaching Clinic, Cooper and Stroud (47) found results which suggest that perhaps one teach-reteach cycle is not enough to obtain significant behavior change when the time interval between lessons is only 15 minutes. In this clinic, specific instruments for evaluating the teaching skills were

used rather than the more global Stanford Teacher Competence Appraisal Guide. Cooper and Stroud speculate that these instruments probably have more face validity, but validity and reliability of the instruments were not established.

Reporting on a series of empirical studies on teaching skills and microteaching for the Stanford Center for Research and Development in Teaching, Berliner (14) summarized the major conclusions. First, contrary to most generalizations which are made about the relationship of time delay and feedback for the modification of behavior, a series of experiments indicated that immediacy of the feedback (using videotapes and supervisors) is not crucial to the acquisition of some behavior. He reports that McDonald and Allen explain this result in the following way:

> The explanation for this may be that the videotape playback reinstates the trainee's performance for him. The whole experience of viewing oneself on the videotape is quite different from receiving information from a second person about one's performance. The character of the feedback experience has changed drastically. Whatever factors might be involved in this new experience are sufficiently different so that the factor of immediacy is no longer relevant (14).

Second, a feedback system in which a trainee views his own behavior, with a supervisor commenting on the behavior, is a very effective technique for modifying some teaching behaviors. This conclusion was formed as a result of experiments investigating reinforcement techniques and probing questioning. The crucial aspect of the supervisor's role is when he identifies the salient behaviors being shown on the videotape recording and reinforces both the model's and trainee's use of these behaviors.

Third, when a videotaped model performance demonstrates positive instances of the desired behavior rather than a mixture of both positive and negative, the trainee's ability to acquire the skill in a transfer task is enhanced.

Fourth, the findings about the effectiveness of perceptual modeling (a videotape or film of a teacher demonstrating certain behaviors) are inconsistent. There is evidence that for some skills, particularly those most easily described, symbolic written descriptions of the skill will suffice. Berliner recommends that, until such time as a taxonomy outlines a classification that will provide information on which skills should be perceptually modeled and which should not, videotaped models as well as written descriptions of the skills should be used.

Fifth, and probably most important, the series of experiments indicates that teaching behaviors can be described behaviorally. This

means that there is a science to teaching as well as an art of teaching.

For more information on this series of experiments investigating technical skills of teaching, modeling behavior, and microteaching, the reader should consult Berliner (14) and McDonald and Allen (41).

Basing its original approach on the technical skills developed at the Stanford Center for Research and Development in Teaching, the Far West Laboratory for Educational Research and Development has developed an in-service training program called the minicourse. The minicourse is defined as a *product* containing instructional films, handbooks, and evaluation forms; the *process* of microteaching; and an organization of product and process known as the *instructional sequence* (39). Using behaviorally stated outcomes and a systematic approach, the minicourse attempts to bring about teacher behavior change without the use of a supervisor.

Minicourse One, designed to increase the teacher's effective use of classroom questions for discussion purposes, has as some of its behavioral outcomes a decrease in the number of times the teacher answered his own question, an increase in the length of pupil's response in words, a decrease in the proportion of teacher talk, and an increase in the proportion of higher cognitive questions. The following excerpts are selected from data presented by Borg (15):

Behavior	Mean Score Before Minicourse	Mean Score Immediately After	Mean Score Four Months After
Answering Own Question	4.47	.71	.73
Length of Pupil Response in Words	5.70	11.55	12.46
Proportion of Teacher Talk	53.18	29.44	30.20
Proportion of Higher Cognitive Questions	26.16	52.27	48.58

All the preceding data represent significant prescore and postscore differences, while there was no significant drop in performance after four months. The early results of the minicourse data indicate a highly significant and effective training procedure for teacher behavior modification.

In an experimental training program with preservice elementary

school teachers at the University of Connecticut, using microteaching and videotape recorders, Goodkind (30) found that the experimental group of student teachers displayed a greater awareness of specific personal habits and mannerisms; a greater awareness and use of specific teaching acts and techniques, particularly of the nonverbal type; greater insight into the activity and interrelationships of children within the classroom; and a greater awareness of the problems of structuring and pacing in their educational program.

Another study with elementary school student teachers was conducted at San Jose State College in the summer of 1966 (37). The purpose of the study was to determine the effectiveness of elementary school interns trained in a summer program by a microteaching approach as compared with interns who received conventional classroom observation and student teaching experience. Contrary to the results reported by Bush at Stanford, the microteaching approach was not found to result in significantly higher ratings of teacher effectiveness either immediately after or a year after training. However, it was concluded that microteaching is an effective training strategy since it achieved results similar to those of conventional training methods, but in only one-fifth the time and with fewer administrative problems. An incidental finding was that pretraining ratings of teaching performance based on a brief videotaped lesson were generally good predictors of later ratings of teacher effectiveness.

One very interesting experiment involving the use of microteaching as a laboratory experience for an educational psychology course was conducted at Purdue University (54). The purpose of the study was to assess what effect microteaching experiences in an educational psychology course would have on student perceptions regarding the relevance of educational psychology to teaching. Using four control groups and one experimental group which was instructed in teaching skills developed at Stanford, data were drawn from four sources: scores in multiple-choice exams, scores from five narrative papers, responses to the Purdue Rating Scale for Instruction, and a short questionnaire evaluating the discussion sections.

The investigators found that the scores on unit tests indicated no significant differences between the experimental group which practiced microteaching and the control groups which met with discussion leaders to discuss papers, test readings, and unit tests. Thus, the microteaching group performed as well in content knowledge of educational psychology as the control groups which spent extra time discussing course-related materials.

When the participants were asked to rate various characteristics of

the course instructor and the course in general, the microteaching group rated the instructor poorer than at least two of the control groups on ten out of eleven items. However, they gave higher ratings than the control groups to those course aspects having to do with laboratory facilities, how well the course was meeting their ultimate and immediate goals, and the presentation of subject matter (in lectures, recitation, and laboratory). The authors conclude that a microteaching experience focusing on teaching skills is an important adjunct to the educational psychology course. Subjects tend to perceive such an experience as valuable and relevant to their teaching goals.

Another research study using a microteaching format was conducted at the Teaching Laboratory at the University of Texas at Austin (23). Using radio recordings and peers instead of actual students, the study was designed to yield direct evidence of differences in undergraduate teacher candidates' verbal teaching behaviors associated with their participation in the Teaching Laboratory. The experimental group taught a lesson; received pupil, instructor, and audiotaped feedback; and taught a reteach lesson. The control group read and discussed issues but had no direct experience in teaching. Preceding and following the training sessions, pretest and posttest lessons were taught. Using a modified version of OScAR 5V, called Laboratory Observation Schedule and Record (LOScAR), statistically significant differences between the groups were obtained for seventeen of twenty-two variables, indicating that verbal teaching behaviors can be clearly modified using a microteaching format.

SUMMARY OF RESEARCH

It is extremely difficult to summarize research findings with different objectives, subjects, conditions, and other variables. However, some generalizations about microteaching and the teaching skills approach can be made:

1. Using a microteaching format, teach-critique/reteach-critique, positive changes in teacher behavior can be achieved which result in a larger repertoire of teaching behaviors.
2. Performance in a microteaching situation can accurately predict subsequent classroom performance.
3. Trainee acceptance of microteaching as a relevant training procedure is high.
4. The feedback dimension of microteaching is probably the crucial one in terms of changing the trainee's behavior.
5. This feedback can come from several sources, but the most

powerful combination seems to be one that utilizes supervisory comments, videotape recordings, and pupil comments.

6. Contrary to previous research evidence, the immediacy of feedback (using videotapes and supervisors) is not crucial to the acquisition of some behaviors.
7. A perceptual model that demonstrates positive instances of the desired behavior, rather than a mixture of both positive and negative, is more powerful in enhancing the trainee's ability to acquire the skill in a transfer task.
8. For certain skills, a perceptual model is preferred over a written description of the skill, while for other skills the evidence is inconclusive.

NEEDED RESEARCH

The needed research on microteaching breaks down into two categories. The first relates to teaching skills and the second to the microteaching process and training protocols. A very good statement of these needs is made by Berliner (14), whose recommendations are summarized here.

Teaching Skills

Validity. The validity of the teaching skills must be established. We know we can train teachers to acquire certain teaching behaviors, but we presently have very little information regarding how these behaviors affect students. Every skill should undergo multivariate analysis to check different achievement and attitude domains in order to understand the nature of a teaching skill with regard to students. These designs should also search for aptitude-treatment interactions in order to refine the validity statements.

Transfer. An effort must be made to determine the transferability of a skill mastered in a microteaching setting to an actual classroom setting.

Interaction Among Skills. At the present time, we have no knowledge of the optimal learning sequence for the various skills. In fact, this sequence will probably vary for different individuals with different aptitudes. Is there a positive transfer from one skill to learning another skill? Is there a proactive or retroactive inhibition effect which would justify different training sequences for different trainees?

Systematic Identification of Skills. The first teaching skills were identified in a rather haphazard fashion. It is becoming increasingly clear that some systematic methods for identifying skills needs to be developed.

Appropriateness Criteria. Although many skills have been identified, we are unable to offer guidelines to trainees regarding the appropriateness and rate of emitting a skill. In order to make decisions about what skills to use and when, the teacher needs to have more data regarding what techniques, in what quantity, can be used under certain conditions with different types of students.

Microteaching Process and Training Protocols

Type of Model. We do not have good information with respect to whether a videotaped, transcribed, or live model should be used, or even whether modeling procedures should be used for all skills.

Teach-Reteach Cycle. The number of times a trainee teaches is usually based on the trainer's best guess. Perhaps the most fruitful approach is training to achieve a prespecified criterion level rather than a set number of teaching experiences.

Length of the Teaching Lesson. We have no research evidence regarding optimal time lengths of the lessons. The usual standard is 5-10 minutes, but this length should not go unchallenged lest it become an orthodoxy.

Number of Students in a Lesson. Although four or five students have traditionally been used, any reliance on this number is unwarranted. The number of students should be based upon information regarding the abilities and aptitudes of the students and the teachers and the nature of the particular skill.

Time Between Teaching Lessons. Is 15 minutes between lessons too short? Should the format be a teaching trial a day? These questions can be answered empirically and may be of use in engineering a more effective training program.

Delay Between Teaching Sessions and Feedback. As pointed out earlier, delay of feedback does not seem to result in any weakening of training. The limits of this effect along a time delay continuum need to be studied.

Feedback Relationships. The Stanford studies have indicated that videotaped and supervisory feedback are powerful, yet we do not know if this feedback must occur on every learning trial. In addition, the minicourse studies indicate that trainees seem to do well without live supervision. Whether this is because of the clarity of the written instructions or because the trainees are experienced professionals is not known.

Number of Skills To Be Practiced Per Training Session. Most of the efforts to date have concentrated on one skill at a time. We do not know if multiple skill training is efficient and feasible.

Review Procedures. The long-term retention of most of the skills is unknown. Borg and his colleagues at the Far West Laboratory are getting some data on this matter for certain skills. However, some sort of review or retraining procedure to keep the skills at a high level seems inevitable.

SUMMARY

Breaking down the complex teaching act into simple, easily taught skills offers much promise for the development of specific teaching skills; however, it is not a cure-all for the problems of teacher education. As has been emphasized in this review, there is much that is not known about training teachers through this method, just as there is much we do not know about training teachers in a more conventional manner. More reliable knowledge about this method of training teachers is needed, and this knowledge can be gained only if institutions using this technique will add their findings to the general fund of knowledge. It is hoped that this review will assist in suggesting areas that need to be explored further.

APPENDIX: TEACHING SKILLS

1. *Fluency in Asking Questions.* The emphasis is on the teacher asking as many questions as possible during the lesson. This skill is practiced in order to develop a new teaching pattern in the classroom for the teacher who tends to depend too heavily on the lecture method. Having achieved this goal, emphasis can be placed on higher order or divergent questions.
2. *Probing Questions.* Probing requires that teachers ask questions that require pupils to go beyond superficial "first-answer" questions. This can be done by asking pupils for more information or more meaning; requiring a pupil to rationally justify his response; refocusing the pupil's or class's attention on a related issue; prompting the pupil or giving him hints; and bringing other students into the discussion by getting them to respond to the first student's answer.
3. *Higher Order Questions.* Higher order questions are defined as questions which cannot be answered from memory or simple sensory description. They call for finding a rule or principle rather than defining one. The critical requirement for a "good" classroom question is that it prompts students to use ideas rather than just remember them. Although some teachers intuitively ask questions of high quality, far too many overemphasize those

that require only the simplest cognitive activity on the part of the students. Procedures have been designed to sensitize beginning teachers to the effects of questioning on their students and to provide practice in forming and using higher order questions.

4. *Divergent Questions.* These questions are characterized by the fact that there are no "correct" answers. They are usually open-ended questions. They require the students to think creatively, to leave the comfortable confines of the known, and to reach out into the unknown. They ask students to make hypotheses and use their imaginations to reorganize concepts into novel patterns.
5. *Reinforcement.* This incentive skill is used by the teacher to reward students for proper behaviors. The skill focuses on the teacher's use of positive reinforcement to increase student participation in classroom discussions.
6. *Recognizing Attending Behavior.* This skill is designed to sensitize and alert the teacher to what is going on in his classroom by observing the cues his students present. By observing their facial expressions, body postures, activity- or nonactivity-directed behaviors, and conversations, the teacher can tell a great deal about their interest level and attention span. From these cues the teacher can make judgments about whether to continue the activity, change it, slow down, speed up, or use a different mode of instruction. Recognizing student attending behavior is a prerequisite for almost any kind of classroom instructional or management decision.
7. *Silence and Nonverbal Cues.* This skill is designed to allow the teacher to control and direct classroom discussions without talking. Nonverbal communication is one of the most neglected means of teacher-student communication, but one of the most powerful. The skill focuses on the controlled use of teacher silence to get students to speak and on techniques of nonverbal communication.
8. *Cueing.* This skill is designed to give the teacher much more control over the success experience a student has in answering a question or in making a comment. By cueing him ahead of time and through the kinds of cues given, the teacher can greatly increase his chances of making a worthwhile contribution to the class.
9. *Set Induction.* This skill is concerned with properly preparing students for some upcoming activity. It includes an interesting or novel way of introducing the activity and establishing common frames of reference between the teacher and students

in order to facilitate communication. It is basically an initiating activity by the teacher.

10. *Stimulus Variation.* This skill deals with both verbal and nonverbal techniques of stimulating students in order to preclude boredom and apathy in the classroom. It is basically concerned with the teacher varying his behaviors in order to keep the students attentive and alert.
11. *Closure.* This skill is complementary to set induction. It consists of teacher activities that will help the students perceive a logical organization of the main ideas and pieces of factual information presented in the lesson. In addition to pulling together the major points and acting as a cognitive link between past knowledge and new knowledge, closure provides the pupil with a needed feeling of achievement.
12. *Lecturing.* Training in some of the successful techniques of lecturing is the focus for this skill. Delivery techniques, use of audiovisual materials, set induction, pacing, closure, planned repetition, and other skills related to lecturing are included. Rather than saying that lecturing is bad as an instructional technique, this skill tries to consider when it is effective to lecture and how to lecture effectively.
13. *Use of Examples.* The use of examples is basic to good, sound, clear teaching. Examples are necessary to clarify, verify, or substantiate concepts. Both inductive and deductive uses of examples can be used effectively by the teacher. Effective use of examples includes starting with simple examples relevant to students' experience and knowledge, relating the examples to the principles or ideas being taught, checking to see if the objectives of the lesson have been achieved by asking students to give examples which illustrate the main point, and using analogies and metaphors to relate the unknown to the known or to liven up the examples.
14. *Planned Repetition.* The purpose of this skill is to clarify and reinforce major ideas, key words, principles, and concepts in a lecture or discussion. The use of planned repetition is a powerful technique in focusing and highlighting important points and in describing them from different points of view. Improper use of this skill can cause confusion and poor learning among students, while proper use can direct their attention to points which the teacher wishes to emphasize. The skill focuses on techniques of literal repetition—simple repetition, spaced repetition, cumulative repetition, and massed repetition.

15. *Completeness of Communication.* Although the importance of and need for clear communication are blatant, clarity is not often the guiding principle in actual communication. Sensitivity training on the importance and the difficulty of being understood is the focus of this skill. A classroom game has been devised which dramatically demonstrates to teachers that what they consider to be clear instructions are often not clear at all to the students. Sensitivity training in the skill of communicating with others will hopefully produce teachers who are more responsive to possible miscommunication.

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*ED documents are available, unless noted otherwise, from the ERIC Document Reproduction service, (EDRS), P. O. Drawer O, Bethesda, Md. 20014, at prices indicated (MF-microfiche; HC-hard copy).

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This article discusses an adaptation of the microteaching approach to an in-service training program called the minicourse. One major difference between the minicourse and the microteaching format is that the minicourse provides a self-contained package of in-service training materials that can be used where videotape recording systems are available.

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This article gives a general overview of what microteaching is as well as a brief description of the Stanford model.

35. Johnson, William D. "Microteaching: A Medium in Which To Study Teaching." *High School Journal* 51:86-92; November 1967.

This article emphasizes the appropriateness of microteaching as an intermediate research environment located between the conceptualization of a methodological innovation and the complexities of the field study. The Teacher Techniques Laboratory, located at the University of Illinois, is also described. In conclusion, the author asserts that microteaching has proved useful for the improvement of instruction as an environment both where teachers may gain skill and where methods of teaching techniques may be systematically investigated and improved.

36. Kallenbach, Warren. "Microteaching as a Teaching Methodology." Paper presented at the Conference on Instructional Methods and Teacher Behavior, Berkeley, California, 1966.
ED 013 791. EDRS Price: MF-$0.65; HC-$3.29.

This article is a general overview history of microteaching, including a brief account of Stanford's Secondary Teacher Education Program, the application of microteaching to elementary intern teachers at San Jose State College, and a review of some of the research related to microteaching.

37._____, and Gall, Meredith D. "Microteaching Versus Conventional Methods in Training Elementary Intern Teachers." *Journal of Educational Research* 63:136-41; November 1969.

This study compares the effectiveness of elementary school interns trained in a summer microteaching program with interns who received conventional classroom observation and student teaching experience. Microteaching was not found to result in significantly higher ratings of teacher effectiveness either immediately after or a year after training. However, it was concluded that microteaching is an effective training strategy since it achieved similar results when compared with conventional methods but in only one-fifth the time and with fewer administrative problems.

38. Kuhn, Wolfgang. "Holding a Monitor Up to Life: Microteaching." *Music Educators Journal* 55:49-53; December 1968.

This article describes the training of music interns in the Stanford Teacher Education Program.

39. Langer, Philip. "Minicourse: Theory and Strategy." Paper presented at the American Educational Research Association annual meeting, Los Angeles, February 1969.
ED 028 114. EDRS Price: MF-$0.65; HC-$3.29.

In this article a description is given of the minicourse concept, including some sample instructional materials used in one minicourse.

40. Mayhugh, S. L. "Microteaching: A Major Component of the Pre-Service Programs." *Contemporary Education* 39:206-209; March 1968.

Analysis sessions at Indiana State University were aimed at developing alternative teaching strategies rather than evaluating good and bad behaviors. An analysis of these behaviors was conducted through a broad spectrum of instruments such as the *Teacher Classroom Activity Profile, Secondary Student Teacher Performance Profile,* Withall's *Social-Emotional Climate Index,* Crispin's *System and Interaction Analysis,* and Mayhugh's *Teacher-Counselor Interaction Analysis System.*

41. McDonald, Frederick J., and Allen, Dwight W. "Training Effects of Feedback and Modeling Procedures on Teaching Performance." Stanford, Calif.: School of Education, Stanford University, 1967.
ED 017 985. EDRS Price: MF-$0.65; HC-$9.87.

This report describes a series of three experiments to assess the use of television recordings to improve teaching performance. In particular, the experiments investigate the effects of (a) self-feedback and reinforcement on the acquisition of a teaching skill, (b) feedback and practice conditions on the acquisition of a teaching strategy, and (c) modeling and feedback variables on the acquisition of a complex teaching strategy.

42. McKitrick, M. O. "Videotaped Microteaching for Preparing Shorthand Teachers." *Journal of Business Education* 43:285-86; April 1968.

This article reports microteaching experiences at Western Michigan University designed to develop practice in teaching for shorthand teachers.

43. McQuerrey, Lawrence H. "Holding a Monitor Up to Life: Microrehearsal." *Music Educators Journal* 55:49-53; December 1968.

Conducted at the University of the Pacific, Stockton, California, this study describes how teaching skills were adapted from the Stanford technical skills of teaching to a music rehearsal. Included were such skills as training in set, in effective use of the voice in giving clear directions, in closure, in stimulus variation, and in establishing appropriate frames of reference.

44. Meier, John H. "Long Distance Microteaching." *Educational Television*, November 1968, p. 20.

This article describes the application of a combination of new media to a six-month training program for a group of persons scattered throughout the United States. Trainees were recorded on videotapes which were sent back to the Greeley, Colorado, Training Center where a staff member reviewed and prepared a critique using the same instrument as the trainees. These critiques were returned to the trainee with the videotape so that the latter could be reviewed in a critique read simultaneously.

45._____. "Rationale for and Application of Microteaching To Improve Teaching." *Journal of Teacher Education* 19:145-57; Summer 1968.

This article relates several common learning theories to the microteaching process of subjecting samples of human behavior to videotape recording, reviewing, responding, refining, and redoing (five R's). A number of applications of microteaching are cited in the article, including in-service application conducted by the Jefferson County School District in Colorado and studies conducted by the Child Study Institute at Colorado State College.

46._____, and Brudenell, Gerald. "Remote Training of Early Childhood Educators." Report of a Title XI Institute of the National Defense Education Act. Greeley: Colorado State College, July 1968.
ED 027 062. EDRS Price: MF-$0.65; HC-$3.29.

Microteaching is included in this report as one of the procedures used to train teachers in their home schools. The authors report on a novel in-service teacher-training model which was used for teachers widely distributed over several states.

47. *Microteaching: A Description.* Stanford, Calif: School of Education, Stanford University, 1966.
ED 019 224. EDRS Price: MF-$0.65; HC-$6.58.

This booklet is a compilation of articles and reports relating to the microteaching activities at Stanford University, including reports of the 1965 and 1966 microteaching clinics.

48. "Microteaching in Student Teacher Laboratory: University of Illinois." *School and Society* 96:128-30; March 2, 1968.

This article is a brief description of an in-service program for instructors in the teacher preparation program.

49. Minnis, Douglas L. "Micro-Teaching Interaction Analysis in a Teacher Education Curriculum." Davis: University of California, February 1968.

This paper is a description of attempts at the University of California, Davis, to incorporate microteaching and interaction analysis into the curriculum of the preservice and in-service teacher education programs.

50. Perlberg, Arye, and O'Bryant, David C. "The Use of Video-Tape Recording and Micro-Teaching Techniques To Improve Instruction on the Higher Education Level." Urbana: College of Engineering, University of Illinois, August 1968.
ED 023 314. EDRS Price: MF-$0.65; HC-$3.29.

This report describes a study conducted at the University of Illinois, utilizing videotape recorders and microteaching for the improvement of college instructors. The techniques employed resulted in favorable attitudinal responses by the participants.

51. Perlberg, Arye; Tinkham, R; and Nelson, R. "The Use of Portable Video Tape Recorders and Micro-Teaching Techniques To Improve Instruction in Vocational-Technical Programs in Illinois." Urbana: College of Education, University of Illinois, 1968.
ED 022 029. EDRS Price: MF-$0.65; HC-$3.29.

This is a report of a pilot program conducted at the University of Illinois to augment the methods courses with microteaching laboratory experiences in order to ease anxieties about student teaching.

52. Schaefer, M., and Stromquist, M. H. "Microteaching at Eastern Illinois University," *Audiovisual Instruction* 12:1064-65; December 1967.

This article discusses microteaching experiences at Eastern Illinois University, including students with majors in men's physical education, mathematics, shorthand, life science, and home economics. There was no focus on any particular technical skills of teaching.

53. Sedgwick, L. K., and Misfeldt, H. T. "Micro-Teaching: New Tool for a New Program." *Industrial Arts and Vocational Education* 56:34-35; June 1967.

This article is a description of a pilot teacher education program in vocational education and industrial arts at Stout State University in Menomonie, Wisconsin.

54. Van Mondfrans, A. P., and others. "Student Attitudes and Achievement in an Educational Psychology Course After Microteaching." Paper presented at the American Educational Research Association annual meeting, Los Angeles, February 1969.
ED 028 994. EDRS Price: MF-$0.65; HC-$3.29.

The purpose of this study was to assess the effects of microteaching experiences on the attitudes and achievements of students in an undergraduate educational psychology course. Of special interest was the question concerning what effect the experience in an educational psychology course would have on student perceptions regarding the relevance of educational psychology to teaching.

55. Ward, Blaine. Personal communication regarding a nationwide survey, 1969.

This is a comprehensive survey of all NCATE institutions regarding usage of microteaching. This communication will be part of Mr. Ward's dissertation at the University of South Dakota, Vermillion.

56. Webb, Clark, and Baird, Hugh. "Selected Research on Micro-Teaching." *Television and Related Media in Teacher Education.* Baltimore: Multi-State Teacher Education Project, August 1967. pp. 27-31.

This paper is a brief summary of selected research related to microteaching at three institutions–Stanford University, Hunter College, and Brigham Young University.

57. Webb, Clark, and others. "Description of a Large-Scale Micro-Teaching Program." Paper presented at the NEA Department of Audiovisual Instruction convention, Provo, Utah. March 25, 1968.
ED 027 250. EDRS Price: MF-$0.65; HC-$3.29.

This article describes the use of microteaching at Brigham Young University, utilizing a 30-minute microteaching session in which peers rather than actual secondary and elementary students were used. The article reports that student reactions to the microteaching experience were very positive.

58. Young, David B. "The Modification of Teacher Behavior Using Audio Video-Taped Models in a Micro-Teaching Sequence." *Educational Leadership* 26:394-95, 397, 399, 401, 403; January 1969.

This article reviews the theoretical rationale and research regarding the use of videotape models in the acquisition of a teaching skill.

ROBERT F. SCHUCK

Microteaching in Teacher Education Programs

Education performs its function in three distinct ways; first, in what it teaches; second, in how it teaches it; and third, in simply being the type of environmental setting it is. Thus the educative process may be viewed as having three basic dimensions: the substantive dimension—what is being taught; the behavioral dimension—the dynamics of the teaching-learning act; and the environmental dimension—the physical setting within which the learning act takes place. A conceptual model incorporating this view has been constructed by Lawrence Downey and appears in Figure I (3:88).

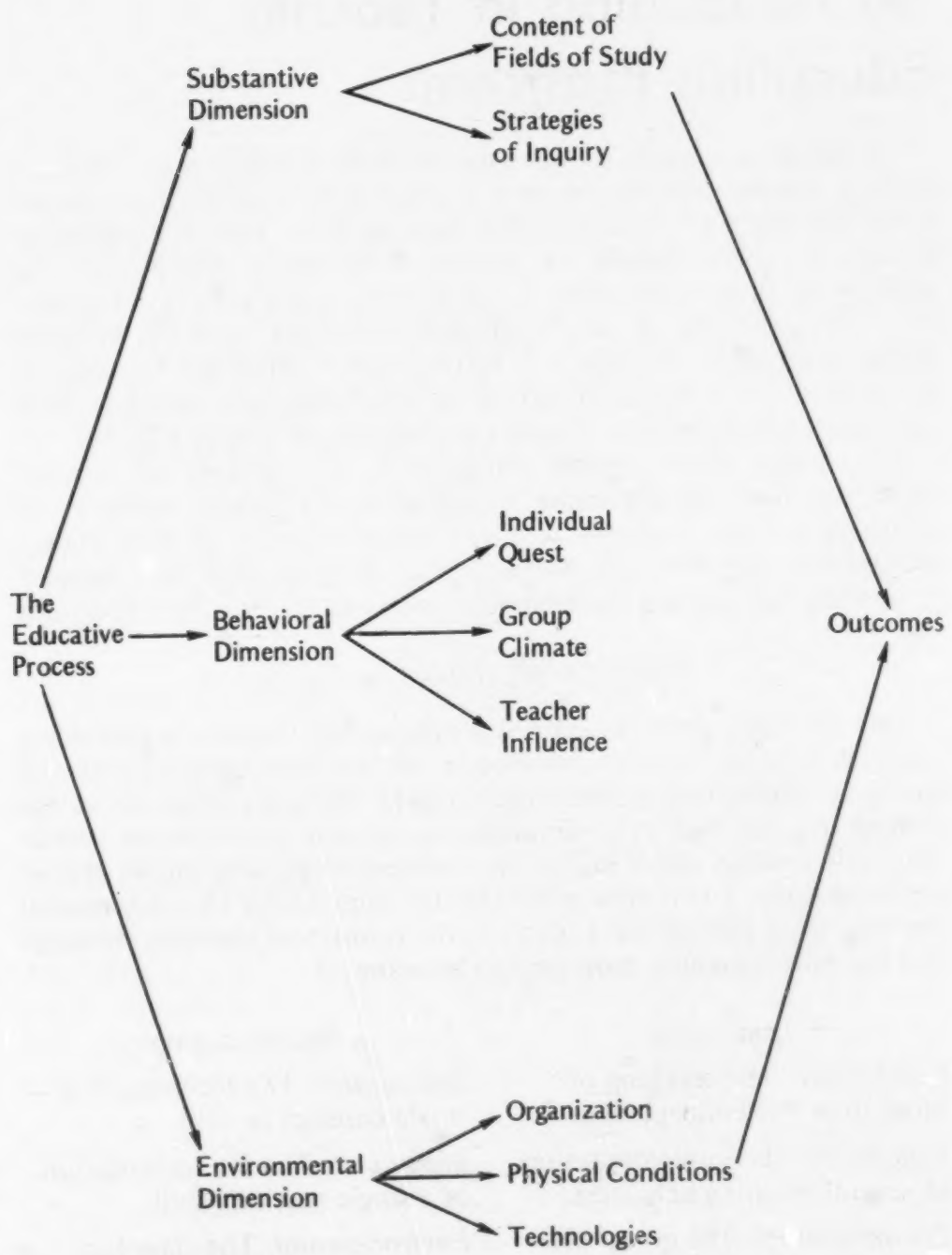
For many years people engaged in the process of teacher education have sought more effective and efficient methods of preparing college students to meet the challenges of their future professional roles. Recent technological developments have assisted in opening up new and exciting dimensions within teacher education.

THE MICROTEACHING CONCEPT

One of these developments is a program of real but scaled-down encounters with children developed at Stanford University in the spring of 1964, called microteaching (1). Microteaching places the prospective teacher in a simulated classroom environment within which he teaches children specific concepts employing one or several teaching skills. When viewed within the scope of the Downey model, the following comparisons between the traditional teaching situation and the microteaching program can be made:

Traditional	*Microteaching*
Substantive. The teaching of more than one concept or skill.	*Substantive.* The teaching of a single concept or skill.
Behavioral. The implementation of several teaching behaviors.	*Behavioral.* The implementation of a single teaching skill.
Environmental. The group consists of several students and the class period is more than 30 minutes in length.	*Environmental.* The class consists of a small group of students and lasts for a limited amount of time (less than 30 minutes).

Figure I
A MODEL OF THE EDUCATIVE PROCESS*



*See: Downey, Lawrence. *The Secondary Phase of Education.* New York: Blaisdell Publishing Co., 1965. p. 88. (Fig. 2, "The Process of Education: A Conceptual Model.")

The purpose of microteaching is to provide an opportunity for those who are preparing to teach to obtain a liberal amount of practice immediately upon their entrance into training, under optimum conditions for the trainees without endangering the learning of pupils. While microteaching has other possible purposes and uses, its principal aim is to provide preinternship training—to get candidates ready to enter responsible internship teaching in the schools.

THE STANFORD TEACHER EDUCATION PROJECT

At Stanford, the forerunner of microteaching by several years was an exercise referred to as a demonstration teaching lesson in which an "invented" game was taught by all interns at the outset of their training to a group of role-playing students. The main objective was to introduce, at the very beginning, a note of realism into the program of the trainees, who for the most part came to the program with the traditional view that prevails in a liberal arts environment—that about all a teacher needs is to know his subject well. The demonstration teaching lesson proved to be a "shock treatment" that quickly and, as was soon discovered, powerfully demonstrated that knowing the subject is not enough.

In addition to the demonstration teaching lesson, an introduction to practice was provided in regular summer high schools where intern-trainees served as observers and teaching aides. At the outset of the experimental internship program, it was decided to try to develop a more efficient type of preparatory practice for internship than a traditional student teaching responsibility in a summer school which appeared to suffer from two limitations. First, substantial responsibility for teaching an entire class prior to any professional training was judged to be premature for the trainee and questionable for the pupils enrolled; and second, the amount of time an intern would have to invest in the student teaching experience was considered disproportionate in view of other summer training requisites.

Though the teacher aide program took less time than student teaching and provided an opportunity for relevant preinternship practice, this, too, proved to have serious limitations in the variety, depth, and evenness of the experience available as well as in costliness and inconvenience to both trainees and staff. Consequently, the microteaching clinic was developed to overcome some of these limitations and to increase the power of the training (4;1).

Examples of Skills

Microteaching aims to break down the complex act of teaching into simpler components to make the learning task more manageable for the beginner. When the trainee engages in a microteaching lesson in his subject, he focuses upon a specific aspect of teaching until he has developed a satisfactory minimum of skill before proceeding to another skill. If he does not master the skill in the first lesson, he views his performance on videotape, receives a critique of it, engages in training, and tries again until he is successful.

Nine specific technical skills which appear to be primary components for training were developed in the secondary education program at Stanford University. These are not mutually exclusive categories. Skill in one may depend upon, or be used to help achieve, skill in another. Each represents a rather specific phase of teaching behavior, the importance of which seems to be commonly agreed upon by experienced teachers.

1. *Establishing Set.* The term *set* refers to the establishment of cognitive rapport between pupils and teacher to obtain immediate involvement in the lesson. Experience indicates a direct relationship between the effectiveness in establishing set and effectiveness in the total lesson. If the teacher succeeds in creating a positive set, the likelihood of pupil involvement in the lesson will be enhanced. For example, one technique for inducing positive set is through the use of analogies that have characteristics similar to the concept, principle, or central theme of the lesson. By training interns in set induction procedures and having them apply these procedures in microteaching sessions, their subsequent classroom teaching is significantly improved.
2. *Establishing Appropriate Frames of Reference.* A student's understanding of the material of a lesson can be increased if it is organized and taught from several appropriate points of view. A single frame of reference provides a structure through which the student can gain an understanding of the materials. The use of several frames of reference deepens and broadens the general field of understanding more completely than is possible with only one. For example, the Emancipation Proclamation becomes more meaningful to the student when it is understood from the frames of references of the Northern white abolitionist, the Southern white, the Negro slave in the seceded South, the free Negro, the European clothing manufacturer, and the political leaders of England, and as an example of the

reserved powers of the American President, than if it is discussed simply as the document issued by Lincoln which freed the slaves. Interns can be trained to become more powerful teachers as they are taught to identify many possible frames of reference that might be used in instruction, to make judicious selection from among them, and then to present them effectively.

3. *Achieving Closure.* Closure is complementary to set induction. Closure is attained when the major purposes, principles, and constructs of a lesson, or portion of a lesson, are judged to have been learned so that the student can relate new knowledge to past knowledge. It is more than a quick summary of the ground covered in a lesson. It pulls together the major points and acts as a cognitive link between past knowledge and achievement. Closure is not limited to the completion of a lesson. It is also needed at specific points within the lesson so that pupils may know where they are and where they are going. Experience indicates that interns can be trained in this skill.
4. *Using Questions Effectively.* The ability to ask provocative, answerable, and appropriate questions, and thus to involve pupils actively, is one of the critical skills in teaching. The microteaching clinic has proved to be an effective means for developing this skill. Novice teachers tend to ask questions which are either so general as to be vague and impossible to answer satisfactorily or so specific that they require a one-word "fill-in" response which tends to kill further responses. This conclusion is based upon observation and analysis of more than two hundred television recordings of classroom lessons. Exercises for use in the microteaching clinic have been devised to build proficiency in preparing and using questions—factual, conceptual, thought-provoking, discussion-stimulating, heuristic questions. The procedure is, first, to instruct the intern in skillful questioning techniques and, second, to have him view videotaped demonstrations of skillful practice. He then applies these techniques in microteaching sessions. Through supervisor and student feedback and by viewing videotapes of his practice sessions, the intern is helped to correct faulty responses and to consolidate his effective practices.
5. *Recognizing and Obtaining Attending Behavior.* Interns can be trained to become more sensitive to the classroom behavior of pupils. The successful experienced teacher, through visual cues, quickly notes indications of interest or boredom, comprehension or bewilderment. Facial expressions, directions of the

eyes, tilt of the head, and bodily posture offer commonly recurrent clues which make it possible for the skilled teacher to evaluate his classroom performance according to pupil's reactions. He can then change his pace, vary the activity, introduce new instructional strategies, and improve the quality of his teaching. Unlike his more experienced counterpart, the intern teacher has difficulty perceiving and interpreting these visual cues. Through 16mm motion picture films, 35mm still picture protocols of classrooms, and videotape recordings of interns in microteaching sessions, supervisors are able to sensitize interns to visual cues of pupils' attending and nonattending behavior.

6. *Control of Participation.* Microteaching sessions enable interns to analyze the kinds of pupil-teacher interaction which characterize their teaching. Control of pupils' participation is one important variable in successful learning for the pupils. Microteaching sessions provide an opportunity for interns to practice different techniques for encouraging or discouraging classroom interaction and to gain insight into the causal relationship between a series of teacher-pupil interactions. When an intern develops the skill to analyze and to control the use of his accepting and rejecting remarks, his positive and negative reactions, his patterns of reward and punishment, he has taken a major step toward effective teaching.
7. *Providing Feedback.* The feedback process in the training of teachers may be simply stated as providing "knowledge of results." Interns often ignore the availability of information accessible during the lesson. Questioning, visual cues, and informal examination of performance are immediate sources of feedback. Interns can be taught appropriate techniques to elicit feedback from students and to modify their lesson accordingly. Teachers unconsciously tap a variety of feedback sources, but unless they are sensitized, they tend to rely unevenly on a limited number of students as "indicators" and to rely on a restricted range of feedback cues.
8. *Employing Rewards and Punishments (Reinforcement).* Reinforcing desired pupil behavior through the use of reward and punishment is an integral part of the teacher's role as director of classroom learning. Substantial psychological evidence confirms the value of reinforcement in the learning process. The acquisition of knowledge of specific techniques of reward and punishment and the development of skill in using them appropriately in specific situations is most important in training a beginning teacher. Experience indicates that interns

can acquire skill in reinforcement of pupil learning through microteaching practice.

9. *Setting a Model.* The importance of analyzing and imitating model behavior is a basic assumption supporting the use of observation in a training program. Because of the brief, simple character of the microteaching situation, it is possible to provide good models of specific technical skills as an integral part of training. Models can be brief and relatively focused, hence more easily analyzed and imitated. Two levels of skill can be identified—the ability to analyze behavior and the ability to imitate it successfully. The hypothesis, as yet untested, is that interns can be trained to improve their ability to analyze and imitate teaching models. Such skills, it is reasoned, will open a wider range of alternatives and provide for more effective self-perception.

In subsequent years, the Stanford Teacher Education Project devoted much effort toward refinement and further development of the microteaching approach to professional education. As a result of such endeavors, they consolidated the above nine skills into the following seven:

1. Reinforcement
2. Varying the Stimulus
3. Presentation Skill—Set Induction
4. Presentation Skill—Lecturing and Use of AV
5. Illustration and Use of Examples
6. Presentation Skill—Closure
7. Student-Initiated Questions.

Conclusions from Studies

By employing a pretest-posttest design, the Stanford researchers collected and analyzed the data and came to the following conclusions (6):

1. The difference between supervisor and student ratings on reteach lessons was demonstrated. Conclusions from previous microteaching clinics were sustained again—that student ratings are probably a more accurate measure of behavior change than the supervisor ratings.
2. Only one significant change occurred between lessons 1 and 2 (Reinforcement), but in both cases where there were Lessons 3 and 4 for a technical skill, significant improvement occurred. This suggests that perhaps one teach-reteach cycle is not enough to obtain significant behavior change and that an

additional teach-reteach cycle for each skill might be necessary in order to achieve significant improvement.

3. Although the validity and reliability for the specific evaluative technical skills instruments have not been established, they probably offer more face validity for measuring teaching behavior change in the particular skill than does the more global Stanford Teacher Competence Appraisal Guide. More development of these instruments should prove profitable for future microteaching training clinics. Training in the use of the Appraisal Guide and the specific technical skills instruments is strongly recommended for both supervisors and students.
4. The first year's microteaching clinic showed few significant changes between the teach and reteach lessons as measured by students' ratings. It was hypothesized that this was due to the fact that interns were required to reteach immediately upon the completion of the critique session with the supervisor. It was thought that if the interns had a 15-minute break between the teach and reteach lessons, they would have more time to replan their lessons in order to improve on the reteach. The results were mixed. Improvement was made between Lessons 3 and 4 (teach-reteach) where there were two teach-reteach cycles (Reinforcement, and Varying the Stimulus) and between Lessons 1 and 2 for Varying the Stimulus, Illustrating the Use of Examples, and Student-Initiated Questions. This should not be taken to mean that the 15-minute preparation was ineffective, however. Another possible explanation for the lack of improvement in Lessons 1 and 2 has already been noted above.
5. The videotape recorder plays an important role in the supervisory process in microteaching. The staff at Stanford is convinced that the most inefficient use of the videotape is to replay the entire lesson and just sit and watch it. The supervisor needs to point out the specific things (not more than one or two) on which he wants the intern to focus. He needs to replay small segments to emphasize or clarify certain points. In other words, a training course should be required of the supervisors in order to make the most effective use of the videotape in the supervisory process.

SKILL DEVELOPMENT IN MICROTEACHING

Studies conducted at Arizona State University and the University of Connecticut (7;8) provide an example of the incorporation of microteaching in a research strategy. These studies were conducted

to assess the effect of a skill identified in the Stanford microteaching clinics (set induction) upon student achievement, retention, and determination of effective teaching. Specifically, these studies sought to answer the following questions:

1. Will ninth-grade pupils taught by teachers trained in set induction techniques make significant gains in achievement over those taught by teachers who have not been so trained?
2. Is there a significant difference in the ratings of teacher effectiveness ninth-grade pupils give teachers trained in set induction techniques from those given to teachers not trained in set induction procedures?
3. Will ninth-grade pupils taught by teachers trained in set induction techniques retain the material taught to a significantly greater degree than pupils who have been taught by teachers who have not been so trained?
4. Does a significant correlation exist between the ratings ninth-grade pupils give their teachers on the Teacher Demonstration Rating Form and the achievement and retention these pupils register on a pretest-posttest design?

The Experimental Design

The experimental design employed in this study was the pretest-posttest control group design.

A volunteer population of 180 high school pupils were solicited. These pupils were then randomly divided into eighteen groups numbering 10 pupils per group.

The teacher population consisted of 18 education majors who had not taken methods courses, nor had they been exposed to the student teaching experience. These teachers were volunteers who responded to a letter requesting the participation of any student in the College of Education. Each of the 18 teachers participating in the study was assigned at random to one of the pupil groups already established. In turn, each of the groups and the teacher assigned to that group was randomly assigned to either the experimental or control procedure.

Curriculum Assignment

The version of the BSCS Curriculum to be used by each teacher was assigned at random. In both experimental and control groups, three teachers used each version—the Blue, the Yellow, and the Green.

A unit on respiration was employed because of its noncontroversial nature and the fact that the twelve instructional periods

employed in the design closely approximated the instructional time allotment recommended by the BSCS program.

Findings and Conclusions

The findings of this study may be summarized as follows:

1. Pupils within the experimental group made statistically significant mean gains on the achievement test (.01 level of confidence) over those in the control group.
2. Teachers within the experimental group received statistically significant higher ratings on the Teacher Demonstration Rating Form (.01 level of confidence) than the teachers in the control group.
3. Pupils within the experimental group made statistically significant gains on the retention test (.01) over those in the control group.
4. The correlation between those students recording high achievement and retention gains and their ratings of teacher effectiveness were statistically significant (.01 level of confidence) within both the experimental and the control groups.

These findings led to the following conclusions:

1. Teachers who were trained in the deliberate use of set induction techniques in their instructional strategies were viewed by their pupils as being significantly more effective.
2. Pupils taught by teachers trained in the deliberate use of set induction techniques achieved significantly higher than those exposed to teachers not trained in this instructional skill.
3. Pupils who viewed their teachers as effective tended to make greater gains in achievement and retained better the material taught.

THE BRIGHAM YOUNG UNIVERSITY PROGRAM

As information concerning the structure and implementation of the microteaching concept in professional education programs diffused throughout the nation, several institutions incorporated either the total program or variations thereof into their respective preservice curricula. One such program was undertaken at Brigham Young University under the leadership of W. Dwayne Belt (9).

Brigham Young University is one of the largest teacher-training institutions in the country but is located in a relatively low population area. Locating enough student teaching stations for 500 student teachers each semester is a constant problem. In an effort to

alleviate this problem, members of the teacher education faculty have investigated several innovations and adapted some of them to their particular program. One of these is microteaching.

Advantages and Purposes

In many institutions, microteaching is used in one-to-one relationship—involving only the student teacher, his college supervisor, and the microclass. However, due to the large number of prospective teachers to be trained at Brigham Young University, microteaching has been expanded to include the trainee's classmates. This group assists the college instructor in the evaluation of the microteaching done by each member of the class. It is felt that having the class observe and critique fellow trainees has several advantages. Among them are the following:

1. Observing others teach and discussing their performance broadens the experience of the observer and, therefore, lessens the number of actual presentations required by each trainee to alter his own teaching behavior.
2. Using the trainees as observers expands the evaluation process and sensitizes each trainee, thus enabling him to assess his own teaching behavior more critically.
3. Having a group observe the lesson presentation usually results in a variety of creative approaches for presenting similar lessons or concepts.

These purposes will be reached through the following specific objectives:

1. To provide the trainee contact with the referents—teaching, role development, and behavior analysis.
2. To provide the trainee with teaching practice in a controlled situation.
3. To provide the trainee with immediate feedback on his performance.
4. To provide the trainee with an opportunity to observe himself in action in a teaching situation and to discuss his observations with a supervisor and with the pupils he has taught.
5. To provide the trainee with an opportunity to plan for correction of specific weaknesses and to carry out these plans in practice and reteaching sessions in the miniature classroom.

Description of the Program

Microteaching at Brigham Young University consists of the presentation of a lesson by a student teacher to a group of students

from the local public schools. When these students are not available, the microclass is composed of his peers from the college class. The trainee's college instructor, the other members of his college class, and the microclass evaluate his teaching performance. The entire presentation is videotaped and replayed immediately so the trainee can see himself in action.

A typical microteaching session in a secondary school methods class, for example, would proceed as follows:

The student teacher, having been scheduled beforehand, would be prepared to present a 4-8 minute lesson to a class composed of from three to five local high school students. This brief presentation would have as its aim the teaching of a single, specific concept. It would be intended as a self-contained lesson and not simply the first few minutes of a longer segment. With the student teacher and the volunteer class are the other members of the trainee's teacher education class and the course instructor. Occasionally, a second instructor is present to assist in the evaluation.

As the student teacher presents his lesson, his performance is recorded on videotape. A television monitor operates during the taping, allowing the cameraman to adjust his shooting angle or focus. The instructor-evaluator observes the trainee's teaching effort critically and jots down suggestions for improvement and commendations. At the conclusion of the lesson, the high school students and the college class members complete forms evaluating the trainee's performance.

To begin the evaluation, the instructor and the trainee discuss the performance in a general, usually positive, way. The instructor may make suggestions about what to look for during the videotape playback. As the videotape is replayed, a particular segment may be replayed or a "stop action" process may be used if desired. The trainee, the instructor, and the college class observe it and comment freely. Occasionally the high school students are invited to participate in the oral evaluation. (Interestingly enough, it is often the comments of these latter students that are seen by the trainees as being most beneficial.) Specific suggestions for improvement are sought by the instructor. Such suggestions are often made first by the trainee himself. Practice varies at this point, depending on the needs of the trainee as perceived by the instructor-evaluator. Some trainees benefit more from constructive criticism, others from positive reinforcement.

One of the aims of the evaluation session is to prepare the trainee to reteach his lesson. At the conclusion of the discussion and critique, the course instructor, together with the student teacher,

decides upon one or two areas of major difficulty on which the student will concentrate in his next presentation. Sometimes this presentation is made immediately after the evaluation, sometimes from one day to one week later. The reteaching is always done with students other than those who participated in the original lesson. This reteach segment is videotaped and all other conditions are as they were for the initial presentation. Again, evaluation forms are filled out by the microclass and by the trainee's fellow students. The evaluation of the reteach portion of microteaching is briefer than the initial evaluation and is concentrated mainly on the particular improvements which the trainee was attempting.

Evaluation of Program

Microteaching sessions following the pattern described above have been used at Brigham Young University on an experimental basis. It is possible to draw several tentative conclusions about the effectiveness of microteaching as it was used in this situation:

1. Microteaching, with its provisions for immediate feedback and for self-observation by students, offers a unique opportunity for individualized instruction of teacher trainees.
2. Microteaching is valuable in introducing the trainee to different types of classroom situations or problems. Segments of classroom interaction can be taped elsewhere or difficulties can be staged by the pupils of the miniature class. As his areas of weakness are identified and opportunities given him to react to similar situations and problems several times, the trainee gains confidence and skill in handling these situations effectively.
3. Much emphasis is currently being given to the teacher's self-concept and his resulting ability to be an effective person in the classroom. The use of videotapes in microteaching enables the trainee to see himself as he interacts with a group of students and to arrive at some conclusions in regard to his effectiveness in the teaching situation.
4. Judging from the responses obtained on questionnaires administered at the conclusion of the microteaching sessions, 96 percent of the trainees indicated they were benefited by the experience.
5. Trainees agreed that comments and suggestions made by their fellow student teachers were definitely valuable.
6. Performance of students (as judged by supervisors, classmates, and the pupils they teach) was usually improved—sometimes to a great extent—following the evaluation session and videotape playback.

Proposed Research

Permission has been requested from the Utah State Department of Public Instruction to conduct controlled research involving the substitution of microteaching sessions for 50 percent of the student teaching time now required by Brigham Young University. In this study it is hypothesized that there will be no difference in performance ability of the teaching act between two groups of preparing teachers, one of which has completed eight weeks of full-time student teaching and the other of which has done student teaching one-half day for eight weeks, has taught in five microteaching sessions, and has observed other microteaching sessions 30-50 times.

Videotape recordings of the student teaching performance before a class will be made of each experimental and control group member at the beginning of the student teaching block. At the end of student teaching, videotapes will again be made. In both the presessions and postsessions, three taped segments will be obtained, providing a total of six videotapes for each student teacher. These recorded acts of teaching will be mixed randomly as to precondition and postcondition and as to control. Evaluations will be made by the teacher, a college teacher supervisor, and a public school supervisor. Such evaluation will examine teaching performance in four areas:

1. Involving class members in the lesson
2. Asking questions
3. Classroom management
4. Providing for contact with the referent or appropriate vicarious experience.

Several scales designed to measure attitude in the appropriate area will be administered as pre- and postinstruments to each member of experimental and control groups. Changes over time and between groups will be evaluated.

THE SAN JOSE STATE COLLEGE STUDY

Warren Kallenback at San Jose State College studied the effectiveness of microteaching in the preparation of elementary intern teachers at that institution (5). The study was designed to demonstrate whether two randomly assigned groups of elementary school intern teaching candidates differed significantly in selected teaching skills and overall teaching competence after one group had completed a summer microteaching program and the other had completed the regular summer classroom observation and student teaching program, and whether these relationships, if any, persist in the field.

The microteaching program, requiring far fewer hours than the student teaching program, is logistically more feasible for the students and staff of the College. If the outcomes of research studies favor the microteaching program or show no significant differences between them and student teaching programs, then teacher education planners can select between programs on the basis of economy.

Hypotheses To Be Tested

The primary hypothesis was that there would be no significant differences in teaching skills and overall teacher competence of the two randomly divided groups of preservice elementary intern teachers either (a) at the end of the summer program, or (b) during the regular school year. Data were also obtained to test two subsidiary hypotheses:

1. That there would be no significant differences between the groups in demographic factors: age, sex, marital status, grade point average, or previous teaching experience (although some had had one semester of student teaching).
2. That there would be no significant differences between total scores of the judges or teams of judges using the teacher competence instruments of the study.

Method of the Study

The experimental design was as follows:

	Preservice	*In-service*
Microteaching group:	$R\ O_1\ X_1\ O_1$	$O_1\ O_2\ O_1\ O_2$
Student teaching group:	$R\ O_1\ X_2\ O_1$	$O_1\ O_2\ O_1\ O_2$

Where R equals randomly assigned group, 0 equals observation with a given measuring instrument or instruments and X equals the introduction of the experimental variable or variables, which in this study were the microteaching program (X_1) and the student teaching program (X_2). The independent variable was the score from the diagnostic lesson evaluations. The dependent variables were the scores from the criterion lesson and the field study evaluations.

The study population was comprised of the elementary school intern teaching candidates (N=40) selected by the San Jose State College Intern Selection Committee in the spring of 1966. This population was randomly divided into two groups.

Immediately after the summer program commenced, each intern presented a 5-minute diagnostic lesson which was recorded on videotape. Each intern chose his own topic for the presentation.

Each group followed the regular summer program of methods, curriculum, and learning theory courses with the exception of the administration of the experimental variables—the microteaching program and the student teaching program.

At the end of the summer program, each intern again presented a 5-minute lesson of his own choice which was again recorded on videotape.

These videotaped teaching episodes were transferred (dubbed) in random order onto a third set of tapes which served as the basis for judgments of teaching skills by two teams of trained evaluators using the Stanford Teacher Competence Appraisal Guide (STCAG). All judging was double-blind.

Field evaluations were conducted by a team of evaluators trained in use of STCAG and *Instrument for the Observation of Teaching Activities* (IOTA). The instruments were each administered twice.

Tests of significance were made between and among the variables of the study, and correlations were made between selected variables.

Results of the Study

No significant difference was found in teaching skills between the microteaching and student teaching groups at the end of the summer. The same finding was demonstrated in the field follow-up studies.

It was found that the microteaching group differed significantly from the student teaching group in the diagnostic lessons (the pretests). The difference was at the .05 level and favored the student teaching group.

There were significant positive agreements between the summer STCAG and the STCAG and IOTA recorded by field observer teams, each having been trained in judging until 90 percent level of agreement was reached between evaluators. An interrater reliability check was conducted in the spring with the principal IOTA evaluator and another trained evaluator, and the correlation coefficient obtained (.74) is significant at the .01 level (df-10).

No significant differences were found between the microteaching and student teaching group scores on the basis of age, sex, GPA, prior teaching experience, or marital status.

Discussion

The null hypothesis can be accepted for the summer microteaching results, viz., that no significant difference would occur between the microteaching group and the student teaching group as judged from their postsummer criterion lessons. Likewise, no significant differences appeared between groups in the fall and spring semester

follow-up studies. The latter studies involved two independent teams of evaluators—one team using the summer evaluation instrument, STCAG, and the other using IOTA.

The fact that the microteaching group was judged by one team of judges to be significantly less capable than the student teaching group at the beginning of the summer probably adds weight to the value of the microteaching program. For if less able teaching candidates can achieve equality via microteaching with other more capable candidates by the end of a summer program, then the microteaching program has merit in addition to a far greater economy of candidate and staff time. Although informal measures determined that the microteaching group had fewer teaching problems at the beginning of school and was given higher commendations by their principals and supervisors, no formal assessments were made until mid-October.

Some authorities on microteaching feel that its benefits are apparent for only the first few weeks of teaching and after that several other factors may contribute significantly to strengthening or changing teaching skills.

Multiple significance tests and correlations were run between and among the scores of the evaluators. Most of these reached significance; some did not. There is probability of some Type I errors where interrater correlations are low. There is also the probability of some findings appearing as significant chance. The low interrater reliabilities during the observations suggest either that the judges drifted apart in their conceptualizations or that the behaviors observed were too complex for highly interrelated judging.

Suggested Conclusions

Elementary intern teaching candidates participating in the microteaching program prior to their first year of teaching were as capable in teaching skills as the candidates who participated in the summer student teaching program. This was maintained into and throughout the first teaching year.

Both groups achieved satisfactory beginning teaching skill and teacher competence levels by the end of summer, and this ability was maintained, increasing slightly, throughout the teaching year.

Both groups achieved satisfactory levels (for beginning teachers) on the teacher competence appraisals; some (N=7) reached superior levels on IOTA. While more of the microteaching group reached the superior level on IOTA in the fall, this difference was not significant and was not present by spring. The same was true for those judged to be in the lower competence levels (N=9).

The judging of the criterion lessons probably should have demonstrated the microteaching group as superior to the student teaching group inasmuch as they spent time during the summer in microteaching sessions. Yet they did no better than the student teaching group at the end of summer. They may, however, have begun at a significantly lower level of teaching skill. It may be that the summer instruction and supervisor reinforcement was not specific enough in the teaching skills to be mastered.

AN ASSESSMENT

Since the advent of the microteaching concept at Stanford University in the summer of 1965, this program of scaled-down teacher-student interaction has stimulated the research interests of professional educators. As a result of several research programs, data have been collected and upon analysis have indicated the value of some form of incorporation or microteaching into preprofessional education programs. The programs which have been reviewed here are representative of the vast majority of those preservice programs employing microteaching. They were designed to incorporate the following dimensions:

1. An intensive effort is made to get preservice teachers actively involved in the teaching-learning process with students of the age group with which they intend to work.
2. There is a conscious, determined effort to state both teacher and student desired outcomes in behavioral terms.
3. An evaluation based upon behavioral objectives yields a solid data base upon which assessments of the lesson can be made, suggested alternatives examined, and future organizational plans formulated. Such an empirical data base is the main source of strength of this program in the preservice education of teachers.
4. While not universally incorporated in microteaching programs, some teaching skills which researchers hope will lead them toward the development of a theory of teaching have been identified.

Microteaching not only provides an effective environment within which preservice professional teacher education can assume greater effectiveness, but it may be employed by educators as a research strategy which provides a semi-field atmosphere and may well lend new meanings to data analyses. In addition, microteaching holds promise as a research strategy which can be employed by investigators interested in patterns of instruction. An example of this strategy can be seen in the study pertaining to the effects of set

induction skills upon pupil achievement, retention, and assessment of effective teaching. While the form and substantive dimension of microteaching appear to be shifting in relation to the objectives of those wishing to incorporate it into their programs, the fact is that its presence on the educational scene appears to be a certainty for the foreseeable future.

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